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AUTHOR	Lareau, William E.
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ABSTRACT

The World Energy Data System (WENDS) allows qualified users on-line access to non-classified management level data on worldwide energy technology and research and development activities. Information is arranged on textual pages and available by means of a simple accessing procedure. Described in this report are the WENDS concept and approach, the method of data storage, and the information retrieval system. Over 25 figures illustrate how the system operates and provide examples of information displays. This system is used to transmit information on foreign energy technology and programs to Department of Energy divisions, the Congress, and other United States government officials going abroad. (Author/WB)

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WORLD ENERGY DATA SYSTEM

Argonne National Laboratory
Argonne, Illinois

1979

SE 033 179

U.S. DEPARTMENT OF COMMERCE
National Technical Information Service
NTIS

MASTER

WORLD ENERGY DATA SYSTEM
WENDS

by

William E. Lareau

Prepared for

ASTUTE 1979 Spring Conference

Austin, Texas

April 5, 1979

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WORLD ENERGY DATA SYSTEM (WENDS)

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WORLD ENERGY DATA SYSTEM
WENDS

1.0 Introduction

This paper presents a unique application of System 2000: the storage of preformatted textual information in a completely user oriented data base. First I will describe the WENDS concept. Then I will discuss the method of storage of the textual information. Lastly I will address the retrieval system which is thoroughly designed to serve the user.

2.0 What is WENDS?

The World ENergy Data System (WENDS) is an information system which allows qualified users online access to non-classified management level data on worldwide energy technology and research and development activities. WENDS was developed under contract to the Office of International Affairs of the Department of Energy (DOE). The current loading of nuclear data is being supported by the Planning and Analysis Division of the Office of Nuclear Energy Technology, DOE. The data base was developed and is being maintained by the Office of Program Management Support of Argonne National Laboratory. The data base, which resides on Argonne's central computing facility, an IBM 3033, contains data that is in a form immediately retrievable and usable by management level personnel. WENDS has been used to transmit up-to-date information on foreign energy technology and R&D programs to DOE program divisions, the Congress, and other U.S. government officials going abroad.

2.1 Scope

The original purpose of WENDS was to provide an online system containing general energy-related data about countries and specific activity data on all major energy technologies, again organized by country. WENDS was to contain only management level information that was not classified, proprietary or sensitive. This information was to be arranged in textual pages with a logical, easy-to-use accessing method.

2.2 Development

In order to store textual pages for printing and for retrieval on a CRT terminal, the size of the page was limited to 60 lines by 70 characters. Taking into account the maximum display of most terminals, we divided this page into three 20 line screens (Figure 1). The net result was three 20 line by 70 character screens per printed and stored page (Figure 2). The terminal we suggest for our users has the capability of storing three screens at a time. This relieves the user of the strain of reading at a rate of 1200 baud; he or she can leisurely scroll down the page. This feature is not a necessity, especially if the user has a hard copy printer attached to the terminal, but it is a convenience.

2.3 Codes

As most of us are aware, the government has a passion for codes and abbreviations or acronyms. We also know that a code is usually easier to enter than the word or phrase it represents, so we knew that WENDS would need some codes for retrieval of data. Wherever possible, we elected to use codes already employed by the government; for example, WENDS uses the State Department tags codes for country codes. The nuclear facility codes come from the Nuclear Materials Management and Safeguards System (NMMSS).

Even though the government seems to have created an acronym for just about everything, WENDS did require three new coding systems for country data, technology data, and international agreements. Consequently, the WENDS task force arbitrarily assigned codes to fulfill this need.

The country data outline (Figure 3) gives a breakdown of the type of data to be collected and stored in this area of WENDS. The combination of the general topic number and the subtopic letter gives the topic code used in WENDS.

The technology codes (Figure 4) are six digit codes, the first two digits of which represent the nine different energy sources that are to be addressed by WENDS. Each source is divided into research projects called programs, represented by the second two digits. Each program is divided into general activity areas, represented by the last two digits. Each general activity is further subdivided into specific activities which have no codes, but are referenced by the name of the specific activity.

Since international agreements may be multilateral, no code based on country is possible. Instead the coding system for international agreements is based on the energy technology referred to within each agreement. The first two digits of the agreement code have the same values as the first two digits of the technology codes. The last two digits of the agreement code merely make the code unique. By knowing the nine technology codes and the country codes, many of which are self-evident, the user has a good start on accessing the data base.

3.0 Storage of Data

Before I go into the actual storage of data I should tell you something about the definition (Figure 5). We base the main entry on the country or international organization. At level one we have two RGs, one for country data and one for technology or energy source. The source branch is divided into program RG which are further subdivided into activity RGs. You will note that as an offshoot of each main RG we have a page RG, then a screen RG, and finally a text RG. I will explain the use of each of the RGs as I discuss in more detail the methods that we use to fill in the different levels.

3.1 New Entry

When we insert a new country entry into WENDS, using natural language, we insert the country RG which consists of the country name (C10), the country code (C11), the geographic areas (C12-C14), and the country NA (C15). The geographic areas are not used at this time. The country NA is an indicator used to show whether there is any country data available for that country.

The next step is to enter the country data outline into C2, the topic in C21, the topic code in C22, and "NA" in C23 to show that there is no data for that topic yet. At the same time we fill in RGs C3, C4, C5 with the name in C31, C41, C51, the code in C32, C41, C52, and NA in C33, C43, C53. At this point almost all the indexes that relate to that country can be generated, even though there are no pages of information available for that country.

3.2 Country Data

When the background data for this country becomes available for input, all that is required is to find the C2 stub or topic that the page or pages apply to and append or "hang" the screens under it. First the PLI program GETs C2 and removes the NA, then inserts the Page RG; next it inserts the screens of text in appropriate order. The screen number is inserted into C251 and the screen itself in C260. Only nonblank screens are stored so as to conserve disk space without endangering the screen/page relationship.

3.3 Technology Data

In the same manner the PLI program removes the NA and "hangs" the program summaries under C4 based on the program code that was previously loaded when the country index was inserted. The information goes into C44 and C450 and the text in C460.

Since the generic activities are subdivided into specific activities, a little more effort is required to store them. As with country data we have the program GET the general activity that is applicable (C5) and insert the ACTIVITY_PAGE_RG with the specific activity name stored in C541 and the page number in C545. The activity screen numbers are inserted in C550 and the screens which compose the activity page are placed in C560.

There is a special type of page called a Nuclear Facility Profile (NFP). These pages are special not only because they are of fixed format, but more importantly, because they have to be accessible in two different ways in order to provide maximum benefit to the user. To achieve this we had to introduce an additional element. First all NFPs fall under one and only one activity so they can be stored in the activity area of the data base under the appropriate country entry. This enables straightforward retrieval by country and by technology. The other mode of retrieval is across countries by a different classification scheme. This new category has to be stored with the NFP, so we incorporated a new element in the activity page RG, that is the activity page category C546, and we store the NFPs just as we do the activities, under C5.

3.4 Information Entry

There is one entry, called the information entry, that is used by WENDS for responses to all informational commands, as well as prompts or anything else for which we need special arrangements. The information entry is loaded and maintained using natural language because it is so volatile. In this entry we have an assortment of lines and RGs that work extremely well for supplying information about WENDS and prompts to help users find the data they are interested in. I will not go into the actual construction of this entry because it really isn't that important except to remember that this is where we store all the prompts and descriptions of WENDS.

I have explained how we store the textual information in screens 20 lines long, 70 characters wide, and a maximum of 3 screens per page. The indexes or stubs are prestored in RG C2, C3, C4, C5. A PLI program appends the pages onto these stubs. We feel that this procedure is one of the things that makes WENDS unusual. The other concept that makes WENDS unique is the user orientation of the retrieval system.

4.0 Retrieval of Information

WENDS retrieval is driven by four groups of commands: Information, Global, Countries, and International Organizations (Figure 6). All commands are predefined strings using either Report Writer or list commands. This means that users do not need to know anything about System 2000 or TSO or, for that matter, anything about computers. All indexes supply a prompt for the next commands that are applicable to that series, but the experienced user may jump around to any point that he may wish, depending on his knowledge of the commands and construction of WENDS.

4.1 Information Commands

Information commands (Figure 7) return information about WENDS itself or terms and commands used in WENDS. I am going to explain each of these commands and show a sample of them.

The *NEWS* command will return one screen (20 lines) that tells the most recent changes, additions, or updates to the data base or important occurrences in the life of the WENDS system itself (Figure 8).

The *INSTRUCTIONS* command gives a brief overview of the WENDS retrieval system, as well as some tips on how to enter any of the command series at the top of each tree (Figure 9).

The *COMMANDS* command gives the user a list of all applicable retrieval commands and the correct syntax (Figure 10). Please note the indentation. It is intentional to show the logical order of the commands. The *DISPLAY COMMAND(nn) command will return a brief explanation of how and when to use the specified command and a note as to the volume of data that may be retrieved by that command if there will be a great deal of output.

The *HELP* command will give a pointer to the top command in each group of retrieval series (Figure 11). We like to tell users that the help command will return them to the top of the data base. This enables some beginners to get a better handle on the logical construction of WENDS.

We have a *GLOSSARY* and a *DISPLAY GLOSSARY(term) command to describe WENDS terminology (Figure 12).

4.2 Country or International Organization Data Commands

Although there are two series of commands to access background information, I will only address the country data commands because the country and international organization (intorg) commands act exactly the same. The country commands access only the background information on countries and the intorg commands access only the background information on international organizations.

The *COUNTRIES* command will return an index of the countries and their codes that have country data available in the database (Figure 13). This list has been shortened to fit on the viewgraph. Actually there is background data on 52 countries.

At this point I would like to discuss some of the strings and how they provide the prompts. We feel that this is the second important concept involved in WENDS. I will go through the strings with the country data commands.

On the next viewgraph we have described the strings used to create the response and the prompts for the *COUNTRIES* command (Figure 14). The command simply lists the country code (C11) and the country name (C10) based upon the values of C15, the Country NA, and C12, the Area. We use C15 for two purposes: to show if there is country data or if there are nuclear facility profiles, or both. If C15 equals NF then

there are NFPs; if C15 equals CD there is country data only; but if C15 fails, then both country data and NFPs are present. C12, the area, is also used to differentiate international organizations from countries because international organizations do not belong to a geographic region.

Now let's look at the ABB2 strings, one of the prompt suppliers. The string is very simple. All it does is retrieve elements C273 and C274 from one of the C260 RGs in the instruction entry and print it utilizing the print options specified in *ABB1*. The *END* command simply prints the words "NEXT COMMAND?" so the user knows that S2K has completed the previous command and he can enter his next command.

The *INDEX CD(cc) command provides a list of the country data topics and their codes and an indication of whether there is data available for that topic (Figure 15). If the NA from C23 appears in the listing there is no information available for that topic for the specified country. All the country data indexes are identical except for the optional NA value.

The *DISPLAY CD(cc,tcode) command will display the textual pages of the country data for the specified country and topic (Figure 16). If the information is available, it may range from one screen to multiple pages. I would like to point out the use of the ABB1 string and C260. If you recall the ABB1 string said PRINT/BLOCK, REPEAT SUPPRESS, STUB SUPPRESS/, and we are using this to print the C260 RG which contains just text. It is ordered by C242, the COUNTRY_PAGE_ID, and C251, the country screen number. This command will print just the text for the specified topic, coded in page then screen order.

There are two more country data commands but they do not lend themselves very well to viewgraphs so I will explain them. The command *TOTAL CD(cc) will print out all available background information for the specified country. We caution our users to be careful of this and all total commands because they usually produce a great number of pages.

The *SCAN CD(tcode,c1,c2,c3) command will display the country data for the specified topic for up to three countries. This enables the user to compare the information available for those selected countries with one command instead of three. I would like to point out that the WENDS system does absolutely no manipulation of data except to display it at the terminal.

4.3 Technology Commands

The *SOURCE (cc)
*PROGRAM (cc,ss0000)
*ACTIVITY (cc,sspp00)
*INDEX ACTIVITY (cc,ssppaa)
and *INDEX NFP (cc,60pp99)
commands give indexes and prompts to lead the user down to the activity in which he is interested (Figure 17).

Since it was planned that the specific activity data would be fairly extensive and detailed, it was decided to give the user the ability to access these specific activities individually or collectively. Therefore, we have provided four commands to enable the user to view only one type of summary at a time:

the	*MANAGEMENT	(cc,ssppaa,activity)
	*TECHNICAL	(cc,ssppaa,activity)
	*REFERENCES	(cc,ssppaa,activity)
and	*NOTES	(cc,ssppaa,activity)

commands (Figure 18). And one command is available for the user to view all the information contained on the specific activity: the *TOTAL(cc, ssppaa,activity) command.

The *SCAN(ssppaa,c1,c2,c3) command allows the user to access data on a general activity for up to three countries; however, we caution the users that this command will probably result in a very large amount of data so he should use it with care or avoid it completely.

The *NFP(nfpcode) command will display the Nuclear Facility Profile that corresponds to the NFP code supplied by the user.

So far the commands have been rather straightforward and easy to visualize. Now I am going into the more interesting and tricky commands: The global commands.

4.4 Global Commands

We have three series of global commands (Figure 19) and they all lead to either an IAP or an NFP. An IAP is an International Agreement Profile, that is, a one page summary of an energy-related treaty. Since the commands are the same for the IAP and the NFP, I will only address the NFP commands. When a user enters the *GLOBAL* command, he is given a choice between two indexes, NFPI or IAPI, and a prompt (Figure 20A). If he enters the *INDEX GLOBAL(subcategory) command, he will have displayed the global sub-categories applicable to the category that he entered (Figure 20B).

The next step is either to list or index the NFPs. If the user chooses the command *LIST NFP(NFPInn), he will receive an index of all NFPs included in WENDS for the category he selects (Figure 21), but if he chooses the command *INDEX NFP(cc,NFPInn), he will receive an index of those NFPs according to the country code and category that he supplies (Figure 22). The next step is to pick a particular NFP and display it using the *NFP(nfpcode) command (Figure 23).

As you will note there is another method of accessing NFPs, through the *NFPS* track. When the user enters the *NFPS* command he will receive a list of all countries that have NFPs included in the data base (Figure 24). He can then list the NFPs for the country that is applicable and then access the NFP he is interested in.

5.0 Summary

Now you can understand why WENDS is user oriented. The retrieval system is not geared to a static level of expertise but adapts to the user (Figure 25). For the novice user there are prompts and other aids such as a gold card containing all commands and dial-up procedures (figure 26), a system track, and a manual. For the experienced user who knows what he wants and how to get it, direct retrieval of information is supported. This retrieval system, combined with the concept of textual pages of information in a format that is immediately usable and understandable, makes WENDS a unique application of System 2000.

ACKNOWLEDGEMENTS

The World Energy Data System was conceived and the program was initiated by the Office of International Affairs of the Department of Energy. The Office of Program Management Support, C. E. Klotz, Director, of Argonne National Laboratory was commissioned to develop and implement the system. R. E. Stajdohar has served as program manager from program inception and has been responsible primarily for overall management and the development of the system track, logical ordering, and the interpretation of user requirements. He has been assisted in these tasks by B. A. Quinn, Group Leader, who managed system documentation, preparation of users and data preparation manuals, data acquisition, and handling day-to-day activities. M. A. Strong served as Washington data base coordinator by providing liaison, user training and demonstration, and supported data acquisition and preparation. B. C. Huguelet and D. L. Ross assisted in all of the above tasks.

The data base design, program, and system documentation have been primarily tasks of W. E. Lareau and L. Williams (now with Litton Computer Services), with support from J. G. Schnizlein. Personnel from the Applied Mathematics Division provided assistance. Others who have contributed to these technical tasks, but are no longer with Argonne National Laboratory, were B. Lantz, J. Murphy, and B. Anderson.

Judy Kozar and Marina Hillock cheerfully typed the user aids, documentation and much of the data.

SCREEN PAGE RELATIONSHIP

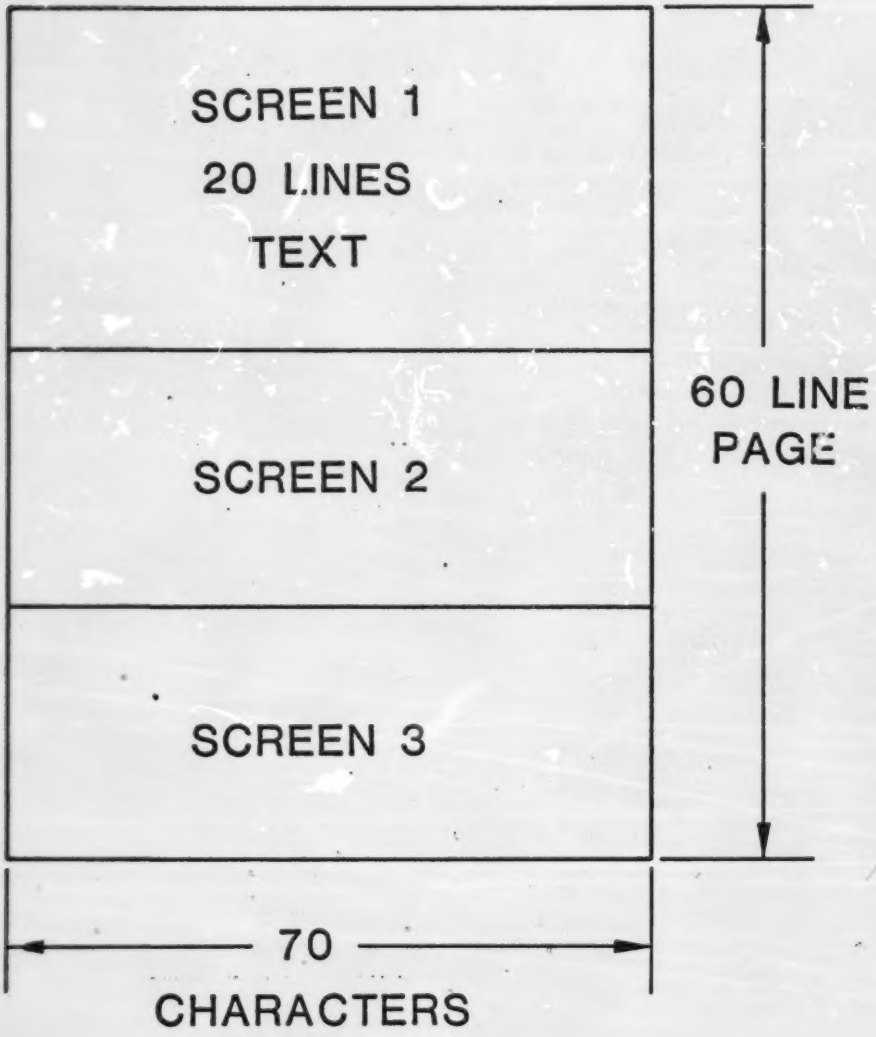


FIGURE 1

70 characters

SCREEN 1 — 20 Lines

COUNTRY DATA--UNION OF SOVIET SOCIALIST REPUBLICS
GOVERNMENTAL STRUCTURE FOR ENERGY POLICY AND R&D SMH 25 AUG 78

The USSR is a federal union consisting of 15 Union Republics. The government is highly centralized, and the state controls the means of production.

THE COMMUNIST PARTY

The real authority rests with the leaders of the Communist Party. The Party is responsible for formulation and implementation of state policy. The two most important organs of the Party are the Politburo (14 members and 8 candidate members), which is responsible for setting basic policy, and the 12 member Secretariat, which is responsible for everyday decision-making and administration. The highest post within the Party is the General Secretary (Leonid I. Brezhnev).

MAJOR GOVERNMENT ORGANS

Supreme Soviet--Legislative Body

Consists of two equal houses (election every five years; candidates must be approved by the Party):

SCREEN 2 — 20 Lines

1-Council of the Union-767 members elected according to population.

2-Council of Nationalities-750 members elected according to territorial units.

Presidium of the Supreme Soviet--36 member body chaired by Leonid I. Brezhnev (ceremonial Chief of State). Oversees government activities between sessions of the Supreme Soviet. Appoints Council of Ministers.

Council of Ministers--highest executive body and most important part of the government in terms of policy planning and implementation (within guidelines set by the Communist Party). Directs ministries, state committees, and other agencies. Currently 100 members. Chairman is Aleksei N. Kosygin.

ENERGY SPECIFIC MINISTRIES

All-Union Ministries

SCREEN 3 — 20 Lines

1-Ministry of the Gas Industry (Sabit Atayevich Orudzhev)

2-Ministry of the Petroleum Industry (Nikolay Alekseyevich Mal'tsev)

3-Ministry of Power Machine Building (Viktor Vasil'yevich Krotov)

4-Ministry of Construction of Petroleum and Gas Industry Enterprises (Boris Yevdokimovich Shcherbina)

5-Ministry of Electrical Equipment Industry (Aleksei Konstantinovich Antonov)

6-Ministry of Chemical and Petroleum Machine Building (Konstantin Ivanovich Brekhov)

Union Republic Ministries

1-Ministry of Coal Industry (Boris Fedorovich Bratchenko)

2-Ministry of Power and Electrification (Pyotr Stepanovich Neporozhniy)

3-Ministry of Petroleum Refining and Petrochemical Industry (Viktor Stepanovich Fedorov)

4-Ministry of Geology (Yevgeniy Aleksandrovich Kozlovskiy)

5-Ministry of Land Reclamation and Water Conservancy (Yevgeniy Yevgen'yevich Alekseyevskiy)

60 Lines

FIGURE 2

WENDS COUNTRY DATA OUTLINE

1. COUNTRY BACKGROUND
   - A. ECONOMIC DATA PROFILE
   - B. DEMOGRAPHIC DATA PROFILE
   - C. PROFESSIONAL LABOR FORCE PARTICIPATION PROFILE
   - D. KEY EDUCATIONAL RESOURCES

2. GOVERNMENT BACKGROUND
   - A. ENERGY POLICY: BASIC LEGISLATION
   - B. GOVERNMENTAL STRUCTURE FOR ENERGY POLICY & R&D
   - C. ORGANIZATION FOR IMPLEMENTATION OF ENERGY POLICY AND R&D

3. ENERGY BACKGROUND
   - A. ENERGY POLICY AND OBJECTIVES
   - B. DESIRED DEGREE OF ENERGY SELF-SUFFICIENCY
   - C. INDIGENOUS ENERGY RESOURCES
   - D. PATTERNS OF ENERGY SOURCES AND USES
   - E. PROJECTIONS OF DEMAND
   - F. PROJECTIONS OF ENERGY SUPPLY, IMPORTS AND EXPORTS
   - G. ENVIRONMENTAL CONSIDERATIONS
   - H. COMMERCIAL APPLICATIONS
   - I. POWER PRODUCTION CAPABILITY
   - J. ENERGY INDUSTRIES

4. ENERGY R&D ACTIVITIES
   - A. ENERGY R&D - STATUS AND OUTLOOK
   - B. ENERGY R&D BUDGET
   - C. ENERGY R&D PRIORITIES
   - D. ENERGY R&D IMPACT
   - E. GOVERNMENT SUPPORTED ENERGY R&D IN INDUSTRY, UNIVERSITIES AND NATIONAL LABORATORIES
   - F. R&D ROLE OF PRIVATE INDUSTRIES

5. INTERNATIONAL ACTIVITIES
   - A. INVOLVEMENT IN INTERNATIONAL ENERGY R&D ORGANIZATIONS
   - B. INTERNATIONAL ENERGY R&D AGREEMENTS
   - C. ASSESSMENT OF INTERNATIONAL ACTIVITIES

6. KEY REFERENCES

7. NOTES AND EVALUATIONS

8. PARTICIPANTS

   (ONLY IN INTERNATIONAL ORGANIZATION TREES)

FIGURE 3

TECHNOLOGY CODES

SSPPAA

SS = SOURCE

PP = PROGRAM

AA = GENERAL ACTIVITY

EXAMPLE: 600908

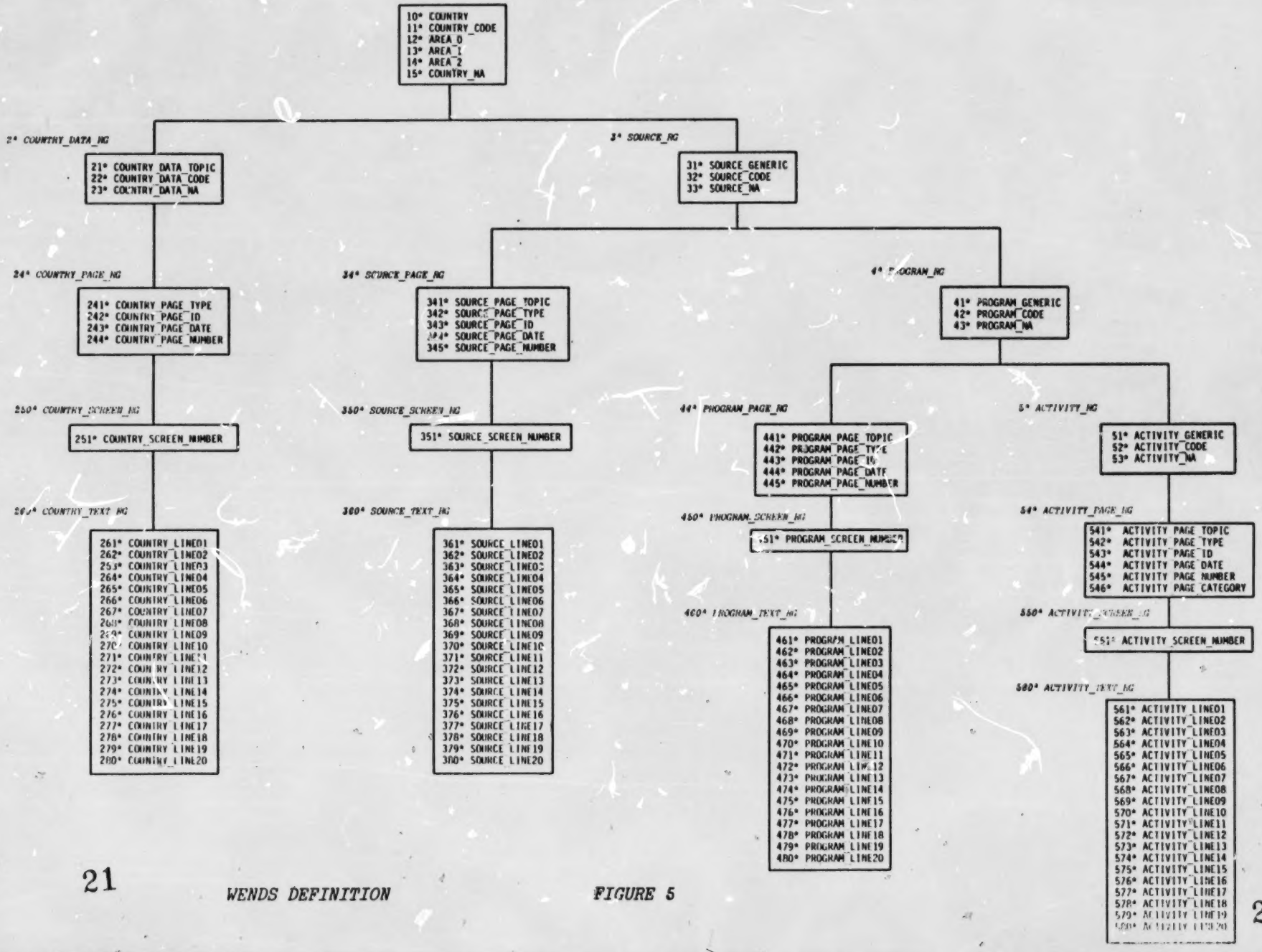
60 = NUCLEAR FISSION

09 = LMFBR PROGRAM

08 = SAFETY

FIGURE 4

WENDS DEFINITION (RELEASE 5)



WENDS DEFINITION

FIGURE 5

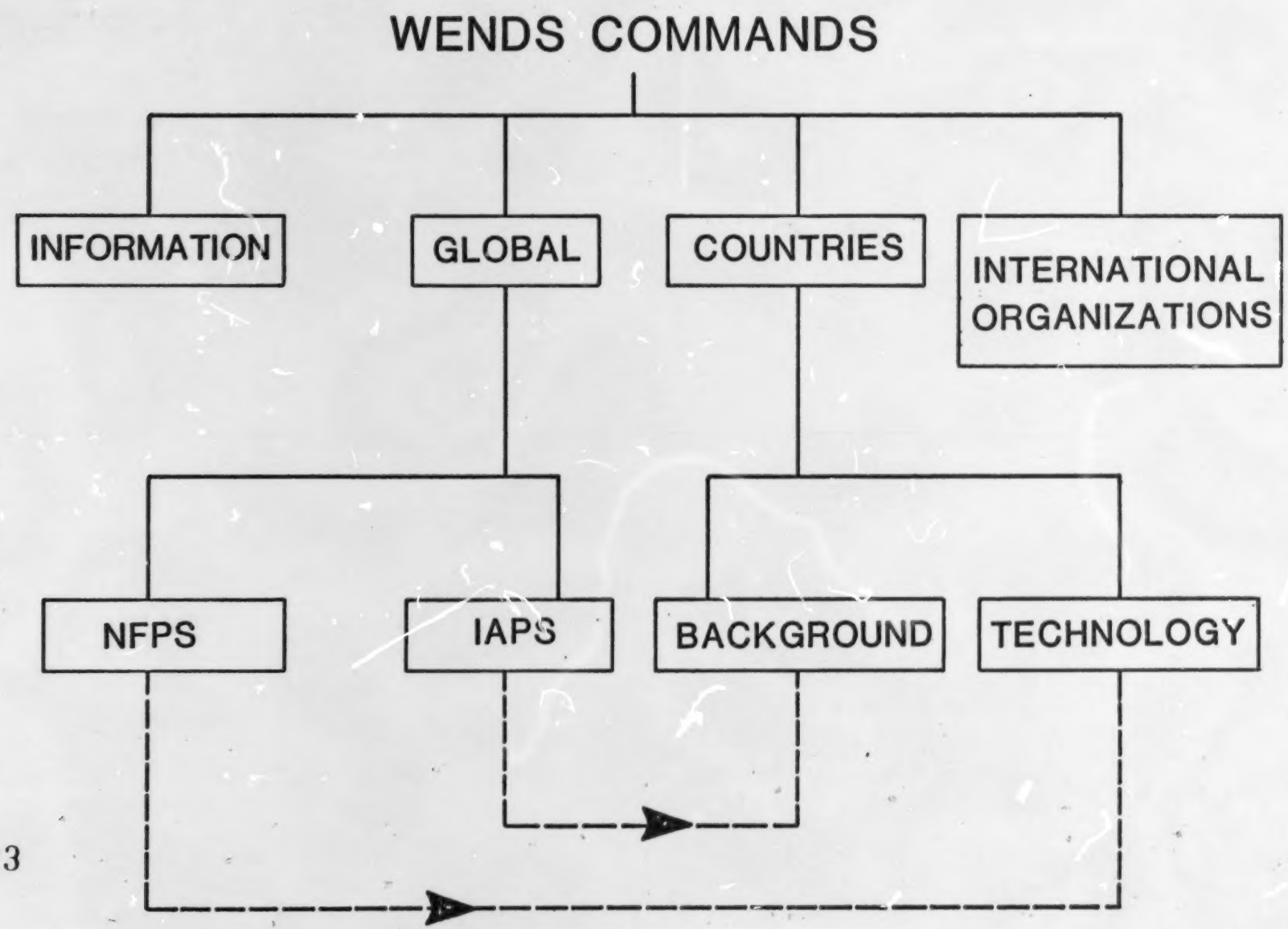

WENDS COMMANDS
INFORMATION
GLOBAL
COUNTRIES
INTERNATIONAL ORGANIZATIONS
NFPS
IAPS
BACKGROUND
TECHNOLOGY

FIGURE 6

INFORMATION COMMANDS

NEWS

INSTRUCTIONS

COMMANDS
    *DISPLAY COMMAND(NN)

HELP

GLOSSARY
    *DISPLAY GLOSSARY(TERM)

FIGURE 7

NEWS

Feb 26 1979 Six hundred nineteen Nuclear Facility Profiles have been added to WENDS. For a list of these - TYPE *GLOBAL*

Jan 31 1979 Country Data updated for the following countries:

BOLIVIA	MALAYSIA	SOVIET UNION
EAST GERMANY	NIGER	UNITED STATES

DEC 28 1978 One hundred Forty-three International Agreement Profiles have been added to WENDS. For a list of these countries type: *IAPS*

DEC 28 1978 Program Summaries have been added for the following countries.

ARGENTINA	ISREAL	SOVIET UNION
BRAZIL	ITALY	SPAIN
CHINA	JAPAN	TAIWAN
WEST GERMANY	PAKISTAN	UNITED KINGDOM
FRANCE	PERU	VENEZUELA
INDIA	SAUDI ARABIA	
IRAN	SOUTH AFRICA	

NEXT COMMAND?

FIGURE 8

```
*INSTRUCTIONS*

                WENDS INSTRUCTIONS

                                                        JGS 16 AUG 78
The World Energy Data System can be divided into five logical trees.
                INSTRUCTIONS
                COUNTRIES
                INTERNATIONAL ORGANIZATIONS
                INTERNATIONAL AGREEMENT PROFILES
                GLOBAL DATA
The instructions tree contains information on the type of material
  contained in WENDS and the commands to retrieve this material.
  This screen is the first in the instructions tree. Additional
  instructions are in the WENDS GLOSSARY and the WENDS COMMANDS
  following.
After you are finished viewing this screen, depress the "return" for
  the next screen.                  When you see this response -
NEXT COMMAND?                       you may enter your next command.

The glossary will clarify the terminology used in WENDS. The new user
  who may want a list of these terms & identifiers may type -
     *GLOSSARY*

  Subsequent prompting for more information will be shown.
Should you want an index of the commands type -
     *COMMANDS*

For data on countries, energy sources, programs or activities, type -
     *COUNTRIES*
This command will provide a list of countries in WENDS followed by a
  prompting message to direct you to more specific information.

For more information on international organizations type -
     *INTORG*

For more information to retrieve global data  type -
     *GLOBAL*
  Instructions to access IAP's & NFP's will appear.

A help command is provided to redirect your commands, type -
     *HELP*     or
     *COMMANDS*

  NEXT COMMAND?
```

FIGURE 9

```
*COMMANDS*
                WENDS COMMAND INDEX
The following is a list of WENDS commands.              JGS 24 OCT 78
10  *NEWS*                      11  *INSTRUCTIONS*
12  *COMMANDS*                  14  *HELP*
13    *DISPLAY COMMAND(nn)      15  *GLOSSARY*
                                16    *DISPLAY GLOSSARY(term)

20  *COUNTRIES*                 60  *INTORG*
21  *INDEX CD(cc)               61  *INDEX INTORG(ii)
22  *DISPLAY CD(cc,tcode)       62  *DISPLAY INTORG(ii,tcode)
23  *TOTAL CD(cc)               63  *TOTAL INTORG(ii)
24  *SCAN CD(tcode,c1,c2,c3)    64  *SCAN INTORG(tcode,i1,i2,i3)

                30  *SOURCE(cc)   or   *SOURCE(ii)
                40    *PROGRAM(cc,ss0000)
                41      *PROGRAM SUM(cc,sspp00)
                50      *ACTIVITY(cc,sspp00)
                59        *INDEX NFP(cc,60pp99)
                83          *NFP(nfpcode)
                51        *INDEX ACTIVITY(cc.ssppaa)
                52          *MANAGEMENT(cc,ssppaa,activity)
                53          *TECHNICAL(cc,ssppaa,activity)
                54          *REFERENCE(cc,ssppaa,activity)
                55          *NOTES(cc,ssppaa,activity)
                56          *TOTAL(cc,ssppaa,activity)
                57          *SCAN(ssppaa,c1,c2,c3)

                70  *GLOBAL*
                71  *INDEX GLOBAL(category)

73  *LIST NFP(NFPInn)           75  *LIST IAP(IAPInn)
74  *INDEX NFP(cc,NFPInn)       76  *INDEX IAP(cc,IAPInn)
83    *NFP(nfpcode)             86    *IAP(iapcode)

81  *NFPS*                      84  *IAPS*
82    *LIST NFP(cc)             85    *LIST IAP(cc)
83      *NFP(nfpcode)           86      *IAP(iapcode)
NOTE- LIST, TOTAL & SCAN commands may produce many pages.
For more information type    *DISPLAY COMMAND(nn)
 NEXT COMMAND?
```

FIGURE 10

```
*HELP*

                WENDS HELP
TYPE -                                              WEL 01 APR 78
    *INSTRUCTIONS*          For a brief introduction to WENDS.

    *COMMANDS*              For a list of commands.

    *GLOSSARY*              For terminology.

    *COUNTRIES*             For countries.

    *GLOBAL*                For index of global data.

    *INTORG*                For international organizations.

    *NFPS*                  For nuclear facility profiles.

    *IAPS*                  For International Agreement Countries.

    *EXIT*                  To exit from WENDS.

  NEXT COMMAND?
```

FIGURE 11

```
*GLOSSARY*
1
                GLOSSARY INDEX
                  03/27/79

  CODE   TERM
***
* 01     WENDS ORGANIZATION
* 02     COUNTRY DATA
* 03     TECHNOLOGY TREE
* 04     ACTIVITY
* 05     INTERNATIONAL AGREEMENT PROFILE
* 06     NUCLEAR FACILITY PROFILE
* 07     NFP INDEX
* 08     PROGRAM SUMMARIES
* 09     WENDS TUTORIALS
* 10     REFERENCE DEPOSITORIES
* 11     NAME-INITIAL CROSS REFERENCE
 To display a term    type    *DISPLAY GLOSSARY(term)
  NEXT COMMAND?
```


FIGURE 12

```
*COUNTRIES*
1
                COUNTRY INDEX
                  03/27/79

   CCODE    COUNTRY
***
* AF        AFGHANISTAN
* AG        ALGERIA
* AR        ARGENTINA
* AS        AUSTRALIA
* AU        AUSTRIA
* BG        BANGLADESH
* BE        BELGIUM
* BL        BOLIVIA
* BR        BRAZIL
* BM        BURMA
* CA        CANADA
* CH        CHINA
* CO        COLOMBIA
* CZ        CZECHOSLOVAKIA
* DA        DENMARK
* EG        EGYPT
* GW        FEDERAL REPUBLIC OF GERMANY
* FI        FINLAND
* FR        FRANCE
* GR        GREECE
* GV        GUINEA
* IN        INDIA
* ID        INDONESIA
* IR        IRAN
* IT        ITALY
* JA        JAPAN
* LY        LIBYA
* LU        LUXEMBOURG
* MX        MEXICO
* NL        NETHERLANDS
* NZ        NEW ZEALAND
* NI        NIGERIA
* NO        NORWAY
* PK        PAKISTAN
* PE        PERU
* PL        POLAND
* PO        PORTUGAL
* SG        SENEGAL
* SF        SOUTH AFRICA
* KS        SOUTH KOREA
* SP        SPAIN
* SW        SWEDEN
* SZ        SWITZERLAND
* TW        TAIWAN
* TZ        TANZANIA
* TU        TURKEY
* UK        UNITED KINGDOM
* US        UNITED STATES
* UV        UPPER VOLTA
* VE        VENEZUELA
* YO        YUGOSLAVIA
 For more information type     *INDEX CD(cc)
                          or   *SOURCE(cc)
  NEXT COMMAND?
```

FIGURE 13

```
DESCRIBE COUNTRIES:
1020*  COUNTRIES (STRING (LIST/TITLE D(15)COUNTRY INDEX,L(5)CCODE,L(50)
       COUNTRY/C11, C10,OB C10 WH (C15 FAILS OR C15 EQ CD) AND C12 NE I
       O:*ABB2(C273)*ABB2(C274)*END*))


DESCRIBE ABB2:
1502*  ABB2 (STRING (*ABB1* *1* WH NK C251 EQ 1 AND C242 EQ IICM01:))


DESCRIBE ABB1:
1501*  ABB1 (STRING (PRINT/BLOCK,REPEAT SUPPRESS,STUB SUPPRESS/))


PR/STUB/C260 WHERE C251 EQ 1 AND C242 EQ IICM01:
 261*  For more information type     *DISPLAY CD(cc,tcode)
 262*  For more information type     *PROGRAM(cc,ss0000)
 263*  For more information type     *INDEX ACTIVITY(cc,sspp00)
 264*  For NFP information  type     *INDEX NFP(cc,60pp99)
 265*  For more information type     *MANAGEMENT(cc,ssppaa,activity)
 266*                         or     *TECHNICAL(cc,ssppaa,activity)
 267*                         or     *REFERENCE(cc,ssppaa,activity)
 268*                         or     *TOTAL(cc,ssppaa,activity)
 269*                         or     *NOTES(cc,ssppaa,activity)
 270*  For more information type     *DISPLAY INTORG(ii,tcode)
 271*  For summary screens  type     *PROGRAM SUM(cc,sspp00)
 272*  For generic activ-   type     *ACTIVITY(cc,sspp00)
 273*  For more information type     *INDEX CD(cc)
 274*                         or     *SOURCE(cc)
 275*  For more information type     *INDEX INTORG(ii)
 276*                         or     *SOURCE(ii)
 277*  To display a term    type     *DISPLAY GLOSSARY(term)
 278*  For more information type     *INDEX GLOBAL(subcategory)
 279*  For more information type     *DISPLAY GLOBAL(code)
 280*  For more information type     *DISPLAY COMMAND(nn)


DESCRIBE END:
1500*  END (STRING (LIST/TITLE NEXT COMMAND?/:))
```


FIGURE 14

```
*INDEX CD(AF)
1
                AF COUNTRY DATA INDEX
                     03/27/79

  TCODE      TOPIC
***
* 1A         ECONOMIC PROFILE
* 1B         DEMOGRAPHIC PROFILE
* 1C         PROFESSIONAL LABOR FORCE PARTICIPATION PROFILE
* 1D         EDUCATIONAL RESOURCES
* 2A         ENERGY POLICY: BASIC LEGISLATION
* 2B         GOVERNMENTAL STRUCTURE FOR ENERGY POLICY & R&D
* 2C         ORGANIZATION FOR IMPLEMENTATION OF ENERGY POLICY & R&D
* 3A         ENERGY POLICY & OBJECTIVES
* 3B    NA   DESIRED DEGREE OF ENERGY SELF-SUFFICIENCY
* 3C         INDIGENOUS ENERGY RESOURCES
* 3D    NA   PATTERNS OF ENERGY SOURCES & USES
* 3E    NA   PROJECTIONS OF DEMAND
* 3F         PROJECTIONS OF ENERGY SUPPLY IMPORTS & EXPORTS
* 3G    NA   ENVIRONMENTAL CONSIDERATIONS
* 3H         COMMERCIAL APPLICATIONS
* 3I         POWER PRODUCTION FACILITIES
* 3J         ENERGY INDUSTRIES
* 4A         ENERGY R&D--STATUS & OUTLOOK
* 4B         ENERGY R&D BUDGET
* 4C         ENERGY R&D PRIORITIES
* 4D    NA   ENERGY R&D IMPACT
* 4E    NA   GOVT SUPPORTED ENERGY R&D IN INDUSTRY UNIV & NATL LABS
* 4F         ENERGY R&D ROLE OF PRIVATE INDUSTRY
* 5A         INVOLVEMENT IN INTERNATIONAL ENERGY R&D ORGANIZATIONS
* 5B         INTERNATIONAL ENERGY R&D AGREEMENTS
* 5C         ASSESSMENT OF INTERNATIONAL ACTIVITIES
* 6          KEY REFERENCES
* 9          NOTES & EVALUATIONS
 For more information type    *DISPLAY CD(cc,tcode)
  NEXT COMMAND?


DESCRIBE INDEX CD:
1021*  INDEX CD (STRING (LIST/TITLE D(15)*1* COUNTRY DATA INDEX,L(5)TCO
       DE,B(0),L(2),L(59)TOPIC/C22,C23,C21,OB C22 WH C12 NE IO AND C11
       EQ *1*:*ABB2(C261)*END*))
```


FIGURE 15

```
*DISPLAY CD(AF,2C)

COUNTRY DATA--REPUBLIC OF AFGHANISTAN
ORGANIZATION FOR IMPLEMENTATION OF ENERGY POLICY AND R&D  BW 09 MAY 78

NON NUCLEAR
  Reorganization of Ministries taking place after recent coup.

NUCLEAR
  Atomic Energy Commission at Faculty of Science, Kabul University
  headed by Dr. F. M. Raoufy.


  NEXT COMMAND?

DESCRIBE DISPLAY CD:
1022*  DISPLAY CD (STRING (*ABB1*C260,OB C242,C251 WH NK C22 EQ *2* AND
       NK C12 NE   IO AND C11 EQ *1*:*END*))
```


FIGURE 16

TECHNOLOGY INDEX COMMANDS

*SOURCE(cc)

*PROGRAM(cc,ss0000)

*PROGRAM SUM(cc,sspp00)

*ACTIVITY(cc,sspp00)

*INDEX NFP(cc,60pp99)

*INDEX ACTIVITY(cc,sppaa)

FIGURE 17

TECHNOLOGY RETRIEVAL COMMANDS

*MANAGEMENT(cc,SSPPAA,ACTIVITY)

*TECHNICAL(cc,SSPPAA,ACTIVITY)

*REFERENCE(cc,SSPPAA,ACTIVITY)

*NOTES(cc,SSPPAA,ACTIVITY)

*TOTAL(cc,SSPPAA,ACTIVITY)

*SCAN(SSPPAA,c1,c2,c3)

*NFP(NFPCODE)

FIGURE 18

GLOBAL COMMANDS

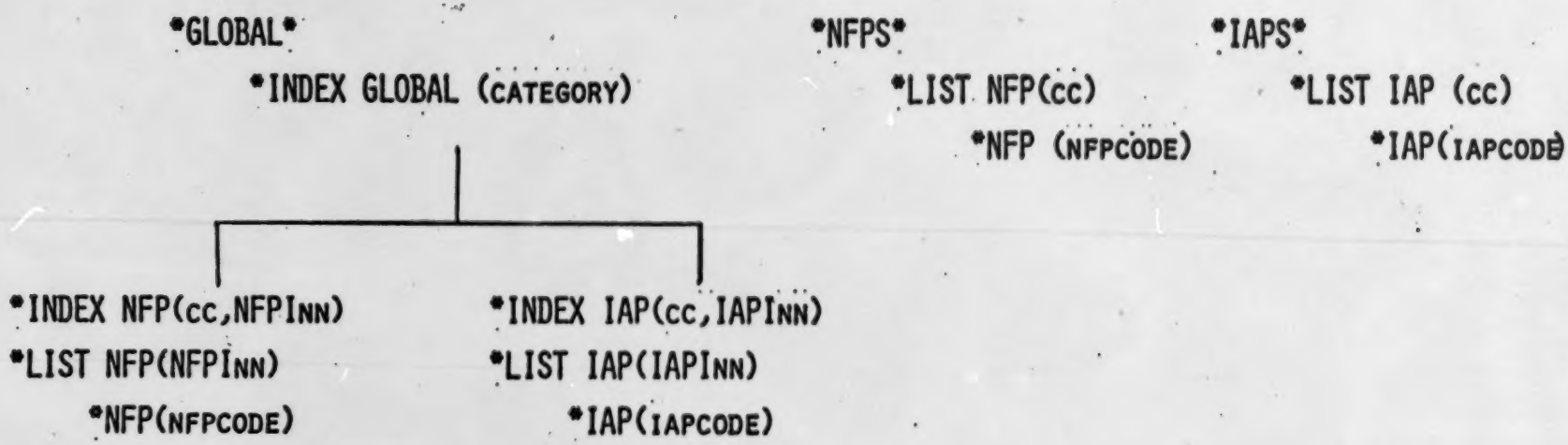


FIGURE 19

```
*GLOBAL*
1
                GLOBAL DATA INDEX
                    03/27/79

  CODE              GLOBAL DATA CATEGORY
***
* IAPI              INTERNATIONAL AGREEMENT PROFILE INDEX
* IRES      NA      INDUSTRIAL RESOURCES
* NFPI              NUCLEAR FACILITY PROFILE INDEX
* SFPI      NA      SOLAR FACILITY PROFILE INDEX
 For more information type     *INDEX GLOBAL(subcategory)
  NEXT COMMAND?
```

FIGURE 20A

```
*INDEX GLOBAL(NFPI)
1
                GLOBAL DATA SUB-CATEGORY INDEX
                          03/27/79

  CODE              SUB-CATEGORY
***
* NFPI01           MINES
* NFPI02           MILLS
* NFPI03           CONVERSION PLANTS
* NFPI04    NA     ENRICHMENT PLANTS
* NFPI05    NA     HEAVY WATER PLANTS
* NFPI06    NA     FUEL FABRICATION PLANTS
* NFPI07    NA     POWER REACTORS
* NFPI08           RESEARCH AND TEST REACTORS
* NFPI09           FUEL REPRESSING FACILITIES
* NFPI10           SEPERATE FUEL STORAGE FACILITIES
* NFPI11    NA     WASTE DISPOSAL FACILITIES
* NFPI12    NA     OTHER
For more information type     *LIST NFP(NFPInn)
                        or    *INDEX NFP(cc,NFPInn)
  NEXT COMMAND?
```

FIGURE 20B

```
*LIST NFP(NFPI09)
1
WENDS NUCLEAR FACILITY PROFILE INDEX                                PAGE 01
                                                  FAC                NFP
FACILITY NAME          LOCATION                   TYPE CAPACITY STATUS YR CODE

           ARGENTINA
CATEGORY-FUEL REPROCESSING FACILITIES
Ezeiza Atomic Centre   Ezeiza                     UM   (small)  Oper   77 RARG

           BELGIUM
CATEGORY-FUEL REPROCESSING FACILITIES
Eurochemic             Mol                        UMUO 60 te/yr Inactv 66 RBEQ

           BRAZIL
CATEGORY-FUEL REPROCESSING FACILITIES
                       Sepetiba                   UO   5 kg/day Plan   86 RBRB

           CANADA
CATEGORY-FUEL REPROCESSING FACILITIES
Chalk River Nucl Lab   Chalk River                UO   (small)  Inactv    RDAD

           FEDERAL REPUBLIC OF GERMANY
CATEGORY-FUEL REPROCESSING FACILITIES
URG/KEWA                                          UO   1500 te  Plan   86 RGCC
JUPITER                Julich                     HTGR 2 kg/day Oper   77 RGCF
WAK                    Karlsruhe                  UOFB 40 te/yr Oper   71 RGEW
DWK                    Gorleben                   UO   1400 te  Plan   88 RGFU

           FRANCE
CATEGORY-FUEL REPROCESSING FACILITIES
UP-2                   Cap de La Hague            UMUO 800 te   Oper.  66 RFAU
UP-3                   Cap de La Hague            UO   1600 te  Plan   87 RFAV
AT-1                   Cap de La Hague            FB   200 kg   Oper   66 RFER
UP-1                   Marcoule                   UM   1000 te  Oper.  58 RFFJ
SAP                    Marcoule                   FB   5 te/yr  Oper      RFGB

           INDIA
CATEGORY-FUEL REPROCESSING FACILITIES
                       Kalpakkam                  UO   50 te/yr Plan   82 RHED
PREFRE                 Tarapur                    UOUM 100 te   Oper   77 RHIC
                       Trombay                    UThO (small)  Oper      RHID
Plutonium Plant        Trombay                    UMUO 60 te/yr Oper   65 RHIL

           ITALY
CATEGORY-RESEARCH AND TEST REACTORS
ROSPO                  Roma                       OMRR Neglig   Oper   63 RICE
                                                  UO   500 te   Plan   85 RIAA
Eurex-1                Saluggia                   UOUM 10 te/yr Inactv 69 RIBL
ITREC Pilot Plant      Rotondella                 UThO 15 kg    Oper   75 RIBS

           JAPAN
CATEGORY-FUEL REPROCESSING FACILITIES
PNC                    Tokai-Mura                 UO   1500 te  Plan   85 RJAA
PNC                                               FB   120 kg/d Plan   86 RJEE
PNC                    Tokai-Mura                 UO   210 te   Oper   78 RJEF
 For more information type     *NFP(nfpcode)
  NEXT COMMAND?
```

FIGURE 21

```
*INDEX NFP(FR,NFPI09)
1
1
WENDS NUCLEAR FACILITY PROFILE INDEX                          PAGE 01
                                          FAC                 NFP
FACILITY NAME        LOCATION             TYPE CAPACITY STATUS YR CODE

COUNTRY -FRANCE
ACTIVITY-NUCLEAR FACILITY PROFILE
CATEGORY-FUEL REPROCESSING FACILITIES
UP-2                 Cap de La Hague      UMUO 800 te   Oper.  66 RFAU
UP-3                 Cap de La Hague      UO   1600 te  Plan   87 RFAV
AT-1                 Cap de La Hague      FB   200 kg   Oper   66 RFER
UP-1                 Marcoule             UM   1000 te  Oper.  58 RFFJ
SAP                  Marcoule             FB   5 te/yr  Oper      RFGB


1
1
  For more information type     *NFP(nfpcode)
   NEXT COMMAND?
```

FIGURE 22

*NFP(RFFJ)

ACTIVITY--FRANCE SPENT FUEL PROCESSING — NUCLEAR FACILITY PROFILE
CATEGORY-FUEL REPROCESSING FACILITIES — SRM 26 JUL 78

FACILITY NAME	LOCATION	FAC TYPE	CAPACITY	STATUS	YR	FAC CODE
UP-1	Marcoule (Bangols-sur-Ceze)	UM	1000 te (te/yr)	Oper.	58	RFFJ

LATITUDE- 44 DEG 10 MIN N — LONGITUDE- 4 DEG 36 MIN E

TECHNOLOGY SOURCE-Commisariat a l'Energie Atomique (CEA)
OWNER/OPERATOR-CEA/Compagnie Gen. des Matieres Nucleare (Cogema)
SUPPLY SOURCE-Spent fuel from domestic gas-graphite reactors
SAFEGUARDS-No safeguards
PRODUCT/USE-Pu/Military use

FUEL STORAGE CAPACITY-

PROCESS-Natural U-metal reprocessing using Purex process

SCHEDULE-Began operation in 1958 for military purposes

REMARKS-Originally used to process spent fuel from reactors G1, G2, and G3 at Marcoule for use in nuclear weapons. Now, UP-1 processes most of the Magnox fuel from French power reactors. After 1981, UP-1 will be used solely for the reprocessing of Magnox fuel from all French reactors. The present capacity seems to be sufficient to meet all domestic Magnox fuel demands in the future, therefore there are no expansion plans at this time. Concentrated high-level liquid waste is stored in two tanks of capacity 60 cubic meters and 90 cubic meters.

REFERENCES

1-Chayes, Abram and W. Bennett Lewis; International Arrangements for Nuclear Fuel Reprocessing; 1977
2-NAC; Intl Data Collection and Analysis; Task 1, Vol II; 6/78

NEXT COMMAND?

FIGURE 23

```
*NFPS*
1
                COUNTRY NFP INDEX
                    03/27/79

   CODE     COUNTRY
***
* AG        ALGERIA
* AR        ARGENTINA
* AS        AUSTRALIA
* AU        AUSTRIA
* BA        BAHRAIN
* BE        BELGIUM
* BR        BRAZIL
* BU        BULGARIA
* CA        CANADA
* CT        CENTRAL AFRICAN REPUBLIC
* CH        CHINA
* CO        COLOMBIA
* CZ        CZECHOSLOVAKIA
* DA        DENMARK
* EG        EGYPT
* GW        FEDERAL REPUBLIC OF GERMANY
* FI        FINLAND
* FR        FRANCE
* GB        GABON
* GR        GREECE
* GL        GREENLAND
* HU        HUNGARY
* IN        INDIA
* ID        INDONESIA
* IR        IRAN
* EI        IRELAND
* IS        ISRAEL
* IT        ITALY
* JA        JAPAN
* MX        MEXICO
* NL        NETHERLANDS
* NG        NIGER
* NO        NORWAY
* PK        PAKISTAN
* PE        PERU
* RP        PHILIPPINES
* PL        POLAND
* PO        PORTUGAL
* RO        ROMANIA
* SF        SOUTH AFRICA
* KS        SOUTH KOREA
* UR        SOVIET UNION
* SP        SPAIN
* SW        SWEDEN
* SZ        SWITZERLAND
* TW        TAIWAN
* TH        THAILAND
* TU        TURKEY
* UK        UNITED KINGDOM
* VE        VENEZUELA
* YO        YUGOSLAVIA
* CG        ZAIRE
* ZA        ZAMBIA
 For more information type     *LIST NFP(cc)
  NEXT COMMAND?
```

FIGURE 43

WENDS RETRIEVAL - USER ORIENTED

ADAPTS TO USERS LEVEL OF EXPERTISE

NOVICE - PROMPTING

EXPERIENCED - DIRECT RETRIEVAL

OUTPUTS TEXTUAL PAGES OF INFORMATION

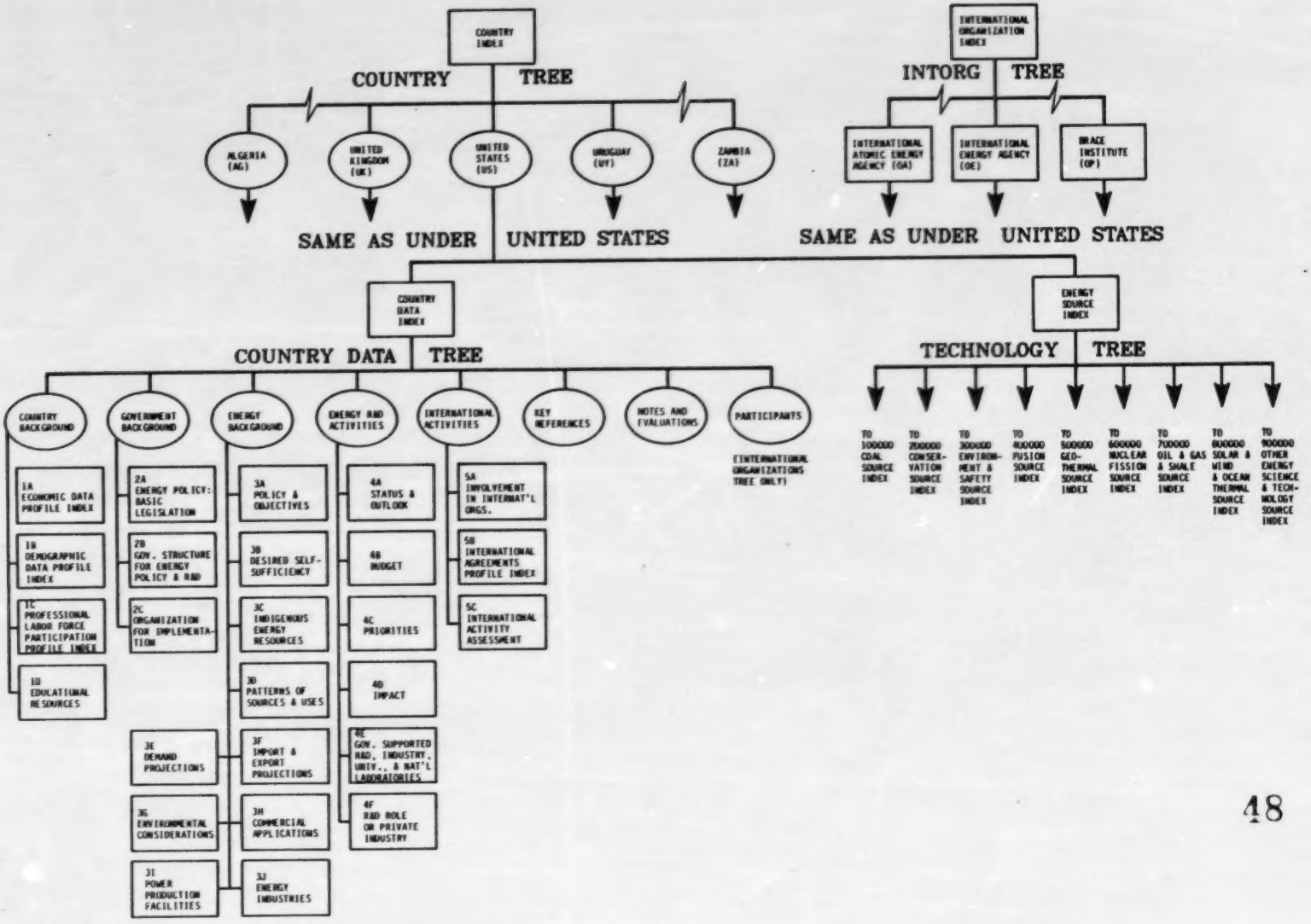
FIGURE 25

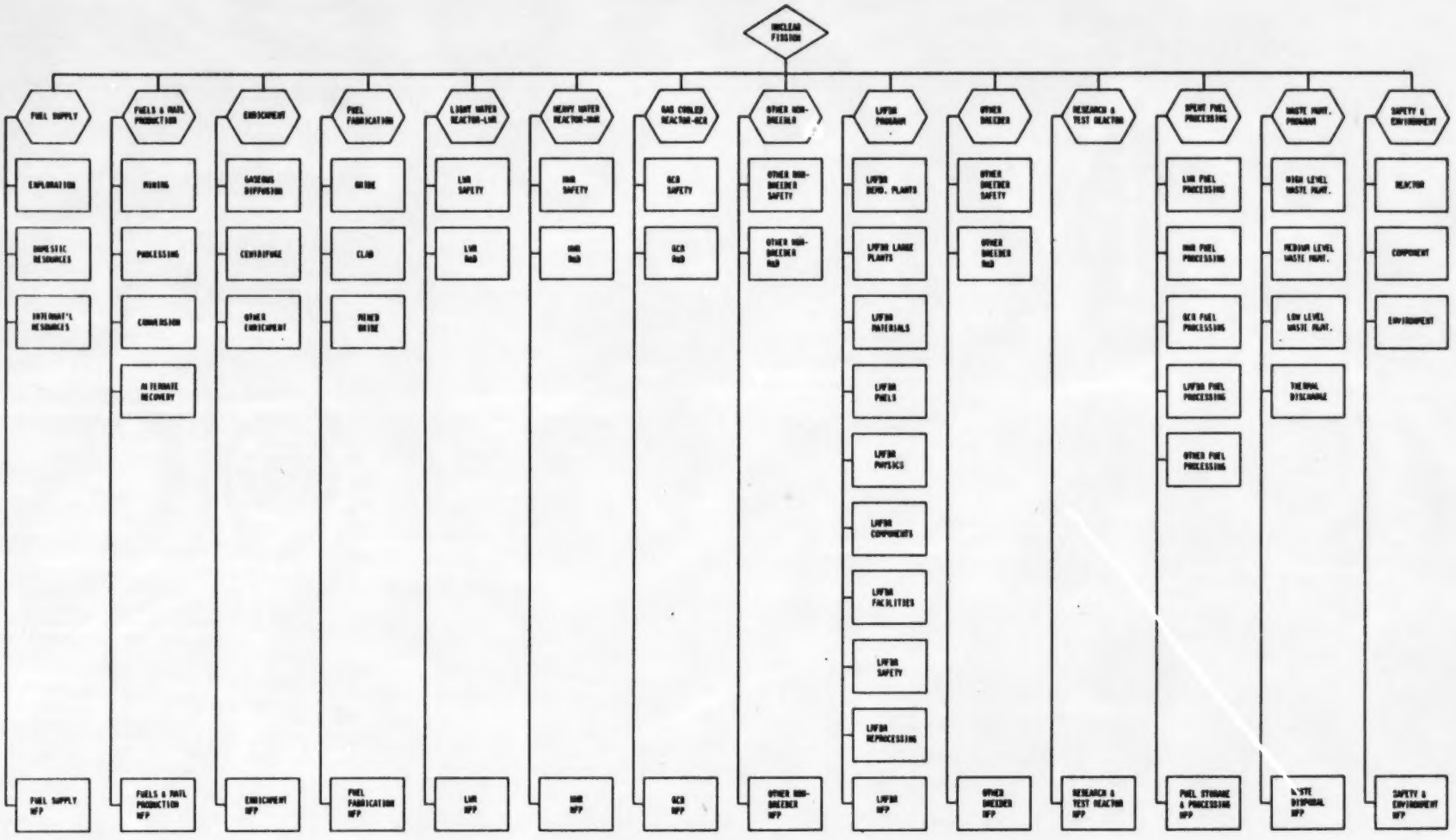
WENDS COMMAND INDEX

```
10  *NEWS*                    70  *GLOBAL*
11  *INSTRUCTIONS*            71  *INDEX GLOBAL(category)
12  *COMMANDS*
13  *DISPLAY COMMAND(nn)
14  *HELP*
15  *GLOSSARY*
16  *DISPLAY GLOSSARY(term)

    73  *LIST NFP(NFPInn)          75  *LIST IAP(IAPInn)
    74  *INDEX NFP(cc,NFPInn)      76  *INDEX IAP(cc,IAPInn)
    83    *NFP(nfpcode)            86    *IAP(iapcode)

    81  *NFPS*                     84  *IAPS*
    82    *LIST NFP(cc)            85    *LIST IAP(cc)
    83      *NFP(nfpcode)          86      *IAP(iapcode)

20  *COUNTRIES*                60  *INTORG*
21  *INDEX CD(cc)              61  *INDEX INTORG(i1)
22  *DISPLAY CD(cc,tcode)      62  *DISPLAY INTORG(i1,tcode)
23  *TOTAL CD(cc)              63  *TOTAL INTORG(i1)
24  *SCAN CD(tcode,c1,c2,c3)   64  *SCAN INTORG(tcode,i1,i2,i3)

30  *SOURCE(cc)   or   *SOURCE(i1)
40    *PROGRAM(cc,ss0000)
41      *PROGRAM SUM(cc,sspp00)
50      *ACTIVITY(cc,sspp00)
59        *INDEX NFP(cc,60pp99)
83          *NFP(nfpcode)
51        *INDEX ACTIVITY(cc,ssppaa)
52          *MANAGEMENT(cc,ssppaa,activity)
53          *TECHNICAL(cc,ssppaa,activity)
54          *REFERENCE(cc,ssppaa,activity)
55          *NOTES(cc,ssppaa,activity)
56          *TOTAL(cc,ssppaa,activity)
57          *SCAN(ssppaa,c1,c2,c3)
```

NOTE - LIST, TOTAL and SCAN commands may produce many pages

FIGURE 26


COUNTRY INDEX
COUNTRY TREE
ALGERIA (AG)
UNITED KINGDOM (UK)
UNITED STATES (US)
URUGUAY (UY)
ZAMBIA (ZA)
SAME AS UNDER UNITED STATES
INTERNATIONAL ORGANIZATION INDEX
INTORG TREE
INTERNATIONAL ATOMIC ENERGY AGENCY (OA)
INTERNATIONAL ENERGY AGENCY (OE)
BRUCE INSTITUTE (OP)
SAME AS UNDER UNITED STATES
COUNTRY DATA INDEX
COUNTRY DATA TREE
COUNTRY BACKGROUND
1A ECONOMIC DATA PROFILE INDEX
1B DEMOGRAPHIC DATA PROFILE INDEX
1C PROFESSIONAL LABOR FORCE PARTICIPATION PROFILE INDEX
1D EDUCATIONAL RESOURCES
GOVERNMENT BACKGROUND
2A ENERGY POLICY: BASIC LEGISLATION
2B GOV. STRUCTURE FOR ENERGY POLICY & R&D
2C ORGANIZATION FOR IMPLEMENTATION
ENERGY BACKGROUND
3A POLICY & OBJECTIVES
3B DESIRED SELF-SUFFICIENCY
3C INDIGENOUS ENERGY RESOURCES
3D PATTERNS OF SOURCES & USES
3E DEMAND PROJECTIONS
3F IMPORT & EXPORT PROJECTIONS
3G ENVIRONMENTAL CONSIDERATIONS
3H COMMERCIAL APPLICATIONS
3I POWER PRODUCTION FACILITIES
3J ENERGY INDUSTRIES
ENERGY R&D ACTIVITIES
4A STATUS & OUTLOOK
4B BUDGET
4C PRIORITIES
4D IMPACT
4E GOV. SUPPORTED R&D, INDUSTRY, UNIV., & NAT'L LABORATORIES
4F R&D ROLE OF PRIVATE INDUSTRY
INTERNATIONAL ACTIVITIES
5A INVOLVEMENT IN INTERNAT'L ORGS.
5B INTERNATIONAL AGREEMENTS PROFILE INDEX
5C INTERNATIONAL ACTIVITY ASSESSMENT
KEY REFERENCES
NOTES AND EVALUATIONS
PARTICIPANTS
(INTERNATIONAL ORGANIZATIONS TREE ONLY)
ENERGY SOURCE INDEX
TECHNOLOGY TREE
TO 100000 COAL SOURCE INDEX
TO 200000 CONSERVATION SOURCE INDEX
TO 300000 ENVIRONMENT & SAFETY SOURCE INDEX
TO 400000 FUSION SOURCE INDEX
TO 500000 GEOTHERMAL SOURCE INDEX
TO 600000 NUCLEAR FISSION SOURCE INDEX
TO 700000 OIL & GAS & SHALE SOURCE INDEX
TO 800000 SOLAR & WIND & OCEAN THERMAL SOURCE INDEX
TO 900000 OTHER ENERGY SCIENCE & TECHNOLOGY SOURCE INDEX



PREPARED IN OCTOBER 1979
BY ARGONNE NATIONAL LABORATORY

WENDS SYSTEM TRACK

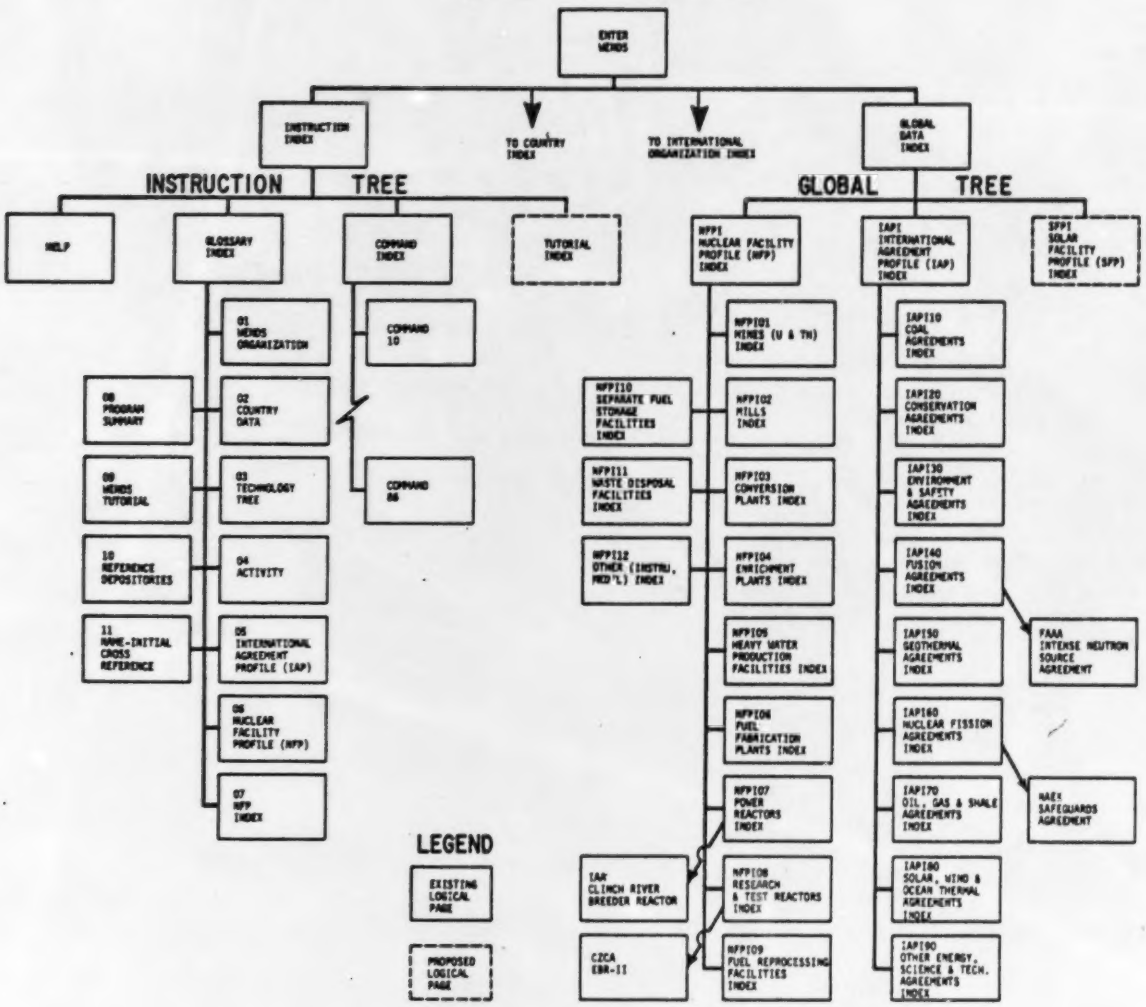


FIGURE 27

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DESCRIBE STRINGS:
1010*  NEWS (STRING (*ABB1*C260 WH NK C21 EQ NEWS AND C11 EQ II:*END*))

1011*  INSTRUCTIONS (STRING (*ABB1*C260,OB C251 WH NK C251 SPANS 01*02
       AND C242 EQ  IIIN01:*END*))
1012*  COMMANDS (STRING (*ABB1*C260 WH NK C251 EQ 03*05 AND C242 EQ III
       N01:*ABB2(C280)*END*))
1013*  DISPLAY COMMAND (STRING (*ABB1*C260 WH NK C242 EQ IICM01 AND C25
       1 EQ *1*:*END*))
1014*  HELP (STRING (*ABB1*C260 WH C242 EQ IIHE01:*END*))
1015*  GLOSSARY (STRING (LIST/TITLE D(15)GLOSSARY INDEX,L(4)CODE,L(50)T
       ERM/C42,C41,OB C42 WHERE NK C32 EQ GL AND C11 EQ II:*ABB2(C277)*
       END*))
1016*  DISPLAY GLOSSARY (STRING (*ABB1*C460,OB C443,C451 WH (C42 EQ *1*
        OR C41 EQ *1*) AND C11 EQ II:*END*))
1020*  COUNTRIES (STRING (LIST/TITLE D(15)COUNTRY INDEX,L(5)CCODE,L(50)
       COUNTRY/C11, C10,OB C10 WH (C15 FAILS OR C15 EQ CD) AND C12 NE I
       O:*ABB2(C273)*ABB2(C274)*END*))
1021*  INDEX CD (STRING (LIST/TITLE D(15)*1* COUNTRY DATA INDEX,L(5)TCO
       DE,B(0),L(2),L(59)TOPIC/C22,C23,C21,OB C22 WH C12 NE IO AND C11
       EQ *1*:*ABB2(C261)*END*))
1022*  DISPLAY CD (STRING (*ABB1*C260,OB C242,C251 WH NK C22 EQ *2* AND
        NK C12 NE   IO AND C11 EQ *1*:*END*))
1023*  TOTAL CD (STRING (*ABB1*C260,OB C242,C251 WH NK C12 NE IO AND C1
       1 EQ *1*:*END*))
1024*  SCAN CD (STRING (*ABB1*C260,OB C242,C251 WH NK C12 NE IO AND NK
       C22 EQ *1* AND (C11 EQ *2* OR C11 EQ *3* OR C11 EQ *4*):*END*))
1030*  SOURCE (STRING (LIST/TITLE D(15)*1* ENERGY SOURCE INDEX ,L(6)SS0
       U00,L(4),L(50)SOURCE/C32,C33,C31,OB C32 WH C11 EQ *1*:*ABB2(C262
       )*END*))
1040*  PROGRAM (STRING (LIST/TITLE D(15)*1* PROGRAM INDEX ,L(6)SSPP00,L
       (4),L(50)PROGRAM/C42,C43,C41,OB C42 WHERE C32 EQ *2* AND C11 EQ
       *1*:*ABB4(C271,C272)*END*))
1041*  PROGRAM SUM (STRING (*ABB1*C460,OB C443,C451 WH  NK C42 EQ *2* A
       ND C11 EQ *1*:*END*))
1050*  ACTIVITY (STRING (LIST/TITLE D(15)*1* GENERIC ACTIVITY INDEX ,L(
       6)SSPPAA,L(2),L(50)ACTIVITY/C52,C53,C51,OB C52 WH NK C42 EQ *2*
       AND C11 EQ *1*:*ABB4(C263,C264)*END*))
1051*  INDEX ACTIVITY (STRING (COMPOSE:FOR REPORT ACTIND,PHYSICAL PAGE
       IS 78 BY 0:DE DATE TDAY = (*FTODAY*):SELECT IF ALL OF(C11 EQ *1*
       * , C542 NE N*):OB C52,C541:PR R(13)C11,(18)$SPECIFIC ACTIVITY I
       NDEX$:PR R(23,DDBMMMBYY)TDAY:*INDACT*))
1052*  MANAGEMENT (STRING (*ABB1*C560,OB C543,C551 WH NK C542 EQ M AND
       NK C541 EQ   *3* AND NK C52 EQ *2* AND C11 EQ *1*:*END*))
1053*  TECHNICAL (STRING (*ABB1*C560,OB C543,C551 WH NK C542 EQ O AND N
       K C541 EQ *3* AND NK C52 EQ *2* AND C11 EQ *1*:*END*))
1054*  REFERENCE (STRING (*ABB1*C560,OB C543,C551 WH NK C542 EQ R AND N
       K C541 EQ *3* AND NK C52 EQ *2* AND C11 EQ *1*:*END*))
1055*  NOTES (STRING (*ABB1*C560,OB C543,C551 WH NK C542 EQ V AND NK C5
       41 EQ *3* AND NK C52 EQ *2* AND C11 EQ *1*:*END*))
1056*  TOTAL (STRING (*ABB1*C560,OB C543,C551 WH NK C541 EQ *3* AND NK
       C52 EQ *2* AND C11 EQ *1*:*END*))
1057*  SCAN (STRING (*ABB1*C560,OB C543,C551 WH C52 EQ *1* AND (C11 EQ
       *2* OR C11 EQ *3* OR C11 EQ *4*):*END*))
1060*  INTORG (STRING (LIST/TITLE D(10)INTERNATIONAL ORGANIZATIONS,L(4)
       II  ,B(4),L(50)ORGANIZATIONS/C11,C10,OB C10 WH (C15 FAILS OR C15
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FIGURE 28

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      EQ CD) AND C12 EQ IO:*ABB4(C275,C276)*END*))
1061* INDEX INTORG (STRING (LIST/TITLE D(10)*1* INTERNATIONAL ORGANIZA
      TION INDEX,  L(5)TCODE,L(4),L(50)TOPIC/C22,C23,C21,OB C22 WH NK
      C12 EQ IO AND C11 EQ *1*:*ABB2(C270)*END*))
1062* DISPLAY INTORG (STRING (*ABB1*C260,OB C242,C251 WH NK C22 EQ *2*
       AND NK C12  EQ IO AND C11 EQ *1*:*END*))
1063* TOTAL INTORG (STRING (*ABB1*C260,OB C242,C251 WH NK C12 EQ IO AN
      D C11 EQ *1*:*END*))
1064* SCAN INTORG (STRING (*ABB1*C260,OB C242,C251 WH NK C22 EQ *1* AN
      D NK C12 EQ IO AND (C11 EQ *2* OR C11 EQ *3* OR C11 EQ *4*):*END
      *))
1070* GLOBAL (STRING (LIST/TITLE D(15)GLOBAL DATA INDEX,L(6)CODE,L(4),
      L(50)GLOBAL DATA CATEGORY/C32,C33,C31,OB C32 WH C11 EQ GD:*ABB2(
      C278)*END*))
1071* INDEX GLOBAL (STRING (LIST/TITLE D(15)GLOBAL DATA SUB-CATEGORY I
      NDEX,L(6)CODE,L(4),L(50)SUB-CATEGORY/C42,C43,C41,OB C42 WH NK C3
      2 EQ *1* AND C11 EQ GD:*ABB1* C361,C362 WH C32 EQ *1* AND C11 EQ
       GD:*END*))
1073* LIST NFP (STRING (*NFL1* *NFIL2* *NFL3*GENERATE NFL WH C11 EQ *1
      * OR C546 EQ  *1*:MESSAGE FILE IS TERMOUT:*ABB3(C268)*END*))
1571* NFL3 (STRING (FOR C10,SKIP 2 LINES,PR L(12,X(50))C10:FOR C546,PR
       L(1,X(55))C562:FOR RECORD,PR L(1)C565:END REPORT:))
1572* NFIL2 (STRING (FOR PAGE,PR (1)?WENDS NUCLEAR FACILITY PROFILE IN
      DEX?,(67)'PAGE',R(72,99)PAGE:PR (43)?FAC?,(67)?NFP?:PR (1)?FACIL
      ITY NAME?,(22)?LOCATION?,(43)?TYPE CAPACITY STATUS YR CODE?:))
1573* NFL1 (STRING (MESSAGE FILE IS S2KMSG: COMPOSE: FOR REPORT NFL, P
      HYSICAL PAGE IS 79 BY 55:SUPPRESS TR FLAG: SELECT IF ALL OF(C551
       EQ 1*,C542 EQ N*):OB C10,C546:))
1074* INDEX NFP (STRING (*NFI1**NFIL2**NFI3* GENERATE NFI WH C52 EQ *2
      * OR C546 EQ  *2*:MESSAGE FILE IS TERMOUT:*ABB3(C268)*END*))
1533* NFI3 (STRING (FOR C10,SKIP 2 LINES,PR (1)?COUNTRY -?,L(10,X(50))
      C10:FOR C52, PR (1)?ACTIVITY-?,L(10,X(60))C51:FOR C546,PR L(1,X(
      55))C562:FOR RECORD,PR L(1)C565:END REPORT:))
1574* NFI1 (STRING (MESSAGE FILE IS S2KMSG: COMPOSE:FOR REPORT NFI,PHY
      SICAL PAGE   IS 79 BY 55:SUPPRESS TR FLAG:SELECT IF ALL OF(C551
      EQ 1*,C542 EQ N*,C11 EQ *1**):OB C52,C546:))
1076* INDEX IAP (STRING (*IAI1**IAI2* GENERATE IAPI WH C32 EQ *2* AND
      C4 HAS C52 EQ *1*:MESSAGE FILE IS TERMOUT:*ABB3(C262)*END*))
1575* IAI1 (STRING (MESSAGE FILE IS S2KMSG:COMPOSE:FOR REPORT IAPI,PHY
      SICAL PAGE IS 79 BY 55:SELECT IF C11 EQ IAP*:ORDER BY C32,C42,C5
      2:FOR PAGE,PR (1)?WENDS INTERNATIONAL AGREEMENT PROFILE INDEX?,(
      67)'PAGE',R(72,99)PAGE:))
1576* IAI2 (STRING (PR (1)?TITLE AND PARTICIPATING COUNTRIES?,(60)?SOU
      RCES?,(71)?CODE?:FOR C42,SKIP 2 LINES,PR L(1,X(57))C41,L(60,X(11
      ))C31,L(71,X(5))C42:FOR RECORD,PR L(3)C52,L(10)C51:END REPORT:))
1081* NFPS (STRING (LIST/TITLE D(15)COUNTRY NFP INDEX,L(4)CODE,B(4),L(
      50)COUNTRY/C11,C10,OB C10 WH (C15 FAILS OR C15 EQ NF) AND C12 NE
       IO:*ABB3(C266)*END*))
1083* NFP (STRING (*ABB1*C560,OB C543,C551 WH NK C542 EQ N AND C541 EQ
       *1*:*END*))
1084* IAPS (STRING (*ABB1*C260,OB C251 WH C11 EQ IAP:*ABB3(C264)*END*)
      )
1085* LIST IAP (STRING (*IAI1* *IAI2* GENERATE IAPI WH C32 EQ *1* OR C
      4 HAS C52 EQ  *1*:MESSAGE FILE IS TERMOUT:*ABB3(C262)*END*))
2060* LIST3 IAP (STRING (*IAI3* *IAI2* GENERATE IAPI WH C32 EQ *1* OR
      C4 HAS C52   EQ *1*:MESSAGE FILE IS TERMOUT:*ABB3(C262)*END*))
2061* IAI3 (STRING ( COMPOSE:FOR REPORT IAPI,PHYSICAL PAGE IS 79 BY 55
```

```
      :DE NAME QUER = *1* :SELECT IF C11 EQ IAP*:OB C32,C42,C52:FOR PA
      GE,PR (1)?WENDS INTERNATIONAL AGREEMENT PROFILE INDEX-?,L(46,XXX
      XXX)QUER,(67)?PAGE?,R(72,99)PAGE:))
1086* IAP (STRING (*ABB1*C460,OB C443,C451 WH C42 EQ *1*:*END*))
1500* END (STRING (LIST/TITLE NEXT COMMAND?/:))
1501* ABB1 (STRING (PRINT/BLOCK,REPEAT SUPPRESS,STUB SUPPRESS/))
1502* ABB2 (STRING (*ABB1* *1* WH NK C251 EQ 1 AND C242 EQ IICM01:))
1503* ABB3 (STRING (*ABB1* *1* WH NK C251 EQ 2 AND C242 EQ IICM01:))
1504* ABB4 (STRING (PR/BLOCK,STUB SUPPRESS/ *1*,*2* WH NK C251 EQ 1 AN
      D C242       EQ IICM01:))
1505* ABB5 (STRING (PR/BLOCK,STUB SUPPRESS/ *1*,*2*,*3*,*4*,*5* WH NK
      C251 EQ 1 AND C242 EQ IICM01:))
1506* ABB6 (STRING (PR/BLOCK,STUB SUPPRESS/*1*,*2* WH NK C251 EQ 2 AND
       C242 EQ IICM01:))
1508* LAT (STRING (LI/TITLE DATA IS BEING PREPARED FOR RESPONSE TO THI
      S AND THE FOLLOWING COMMAND/:))
1509* EXIT (STRING (EXIT:))
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